M.D./Ph.D. Perspectives

University of Virginia

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MSTP Student in Industry:

One Student's Experience with a Biotechnology Externship

by Rooshin Dalal

One of the most common reasons MSTP students cite for choosing such a program is to translate biomedical research results from the "bench to the bedside". Unfortunately, students are given limited exposure to a critical component of this lengthy process. That component is the private sector, more specifically the biotechnology industry. At UVA, a program led by Dr. Gordon Laurie (Cell Biology) is working to increase exposure to this booming industry. UVA is one of only a handful of universities to receive funding from the NIH for a Biotechnology Training Program (BTP). Trainees on this grant are required to complete a specific program of coursework, attend a journal club focused on recent developments in biotechnology, participate in site visits at biotechnology companies, and complete a 4-12 week externship at a biotechnology company chosen by the student. The externship continues to be the highlight of this unique program because it gives students valuable first-hand experience with the daily workings of a biotechnology company. I should note that an externship differs from an internship in that the student continues to receive a regular graduate student stipend from the BTP rather than being compensated by the company itself. This makes the program particularly attractive even to smaller companies.

Rooshin Dalal enjoys science and sightseeing at his San Fransisco externship

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UVA SOM Revises the Curriculum

The UVA Health System has recently embarked on what is known as "The Decade Plan", a strategic plan designed to evaluate and improve multiple aspects of the Health System. As part of this plan, the School of Medicine is addressing medical education with the goal of achieving national recognition by focusing on 6 main aims: 1) enhancing the curriculum, 2) securing physical resources to improve education, 3) implementing education research, 4) recognizing and rewarding faculty for medical teaching as a profession, 5) increasing funds for student financial aid, and 6) revising the structure of the educational administration. It is important for MSTP students to be aware of these goals and the associated changes in the medical school and to understand their implications with respect to our program. Progress has been made in each of these areas, but the biggest and most visible change thus far has been in the area of curriculum enhancement.

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DALAL COMPLETES EXTERNSHIP

(Continued from page 1)

Choosing the right company can be a bit of a challenge. It is not required that the student find one which is doing something similar to his or her own research. In fact, most students take this opportunity to learn about something new, or in my case, focus on something that matches my long-term career interests. The company must also feel that they can benefit from the academic background and experience of the graduate student. Other considerations are location and timing. In my case, I looked for a company in the California Bay Area so that I could spend some time with my family over the summer. The timing of the externship is generally negotiated with the company depending on the scope of the project and the schedules of the current employees with whom you will be working.

After considering all these factors, I was able to arrange my externship with Entelos, Inc (located in Foster City, CA) for seven weeks this summer in June and July. They had a project for me that suited my long-term career interests of using computer modeling and instrumentation design to assist with disease prevention and the development of molecular diagnostic tools for early disease detection. With about 70 employees, Entelos is a medium-sized company. Although they have been in existence for about 8 years, they are not publicly traded yet.

Entelos is the industry leader in predictive biosimulation technology. They use a top-down approach to identify the critical organ systems, tissues, cells, pathways, and molecules which are involved in various diseases. They generate highly sophisticated in silico models of specific diseases which are then used for their ongoing research efforts. Each in silico model is referred to as a Physiolab, and several such Physiolabs have been created so far, including Asthma, Rheumatoid Arthritis, Metabolism (Diabetes and Obesity), and Hematology. Several others are currently in the works as well. Entelos generates revenue by partnering with pharmaceutical companies to provide them with novel information about a particular disease, lead drug compound, or a potential new drug target. As a powerful example of this strategy, consider the following facts. It is well known that a very small fraction of potential new drugs ever make it to Phase I clinical trials, and an even smaller fraction ever make it out of Phase I. One reason for this is the fact that most pre-clinical research is conducted using non-human animals which have anatomies, physiologies, and metabolic profiles that are vastly different from those of humans. Entelos is able to make predictions which are relevant to human disease by performing experiments in “virtual human patients”. These types of experiments have already proven themselves by saving companies such as Johnson & Johnson several years and tens of millions of dollars on a proposed Phase I clinical trial which Entelos had predicted would not be successful. Please visit the company website at www.entelos.com for more information about this powerful technology.

Although the details of my specific project with Entelos are confidential, I can describe in general terms what I did and how my project fits in with the larger goals of the company. I worked with several members of the Metabolism team to explore a potential new approach to treat and prevent obesity. Obesity is the second most common cause of preventable death in this country (smoking is first). With nearly two-thirds of the country overweight, and with half of those individuals meeting the clinical definition of obese, there is a tremendous market for strategies which can help people to lose weight, or prevent them from becoming overweight in the first place. Thus, my project explored the hypothesis that individuals prone to becoming overweight have different eating and metabolic profiles than those who maintain a normal body weight. I spent the early part of my externship becoming familiar with the Metabolism Physiolab, and performing a literature review of all the relevant human clinical data. The next step involved designing experiments on “virtual patients” and running the simulations. Given the complexity of the metabolism model, my simulations sometimes took up to 6 hours to run. I performed several rounds of experiments and analysis to explore as many facets of our hypothesis as I could. In the end, I was able to obtain some useful results which will likely develop into a larger component of the company’s obesity project.

Looking back on my experience at Entelos, I feel that the seven weeks I was away from my research at UVA was time well spent. I was able to learn a great deal about the inner workings of a biosimulation company and the larger biotechnology industry as well. The experience will undoubtedly shape my future career by opening up an avenue which was previously unclear to me. I would strongly encourage students who have some interest in collaborating with or consulting for a biotechnology company to apply to the BTP.

CONGRATULATIONS TO OUR NEWEST PHDS

HEATHER FERRIS

GnRH Signaling and LH-β Gene transcription: Modulation of promoter activity by signaling pathways and transcription factor occupancy (12/04)

NIMA MOSSAMAPARAST

Core histone nuclear transport: mechanisms and links to chromatin assembly (1/05)

SHAWN CARBONELL

Microglial migration following brain injury (11/04)

TIM OLSON

Lymphocyte and Epithelial Contributions to Crohn's Disease Studied in the SAMP1/YitFc Murine Ileitis Model (10/04)

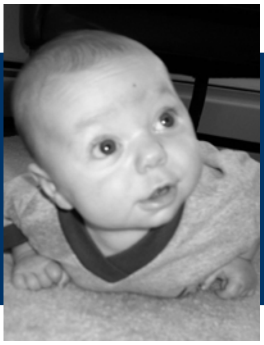
JOE METTENBURG

β-Amyloid Peptide Interactions with α-2-Macroglobulin (9/04)

FUTURE MD/PHDS

CHRISTOPHER EIRIKUR LAVELLE
Born December 9, 2003 to
Dan Lavelle and Kate Steere

DORI RAYZA OLSON
Born July 11, 2004 to
Tim and Mira Olson



HAYDEN COOPER STITES
Born April 1, 2005 to
Ed and Kelly Stites

MSTP SUMMER RETREAT, AUGUST 5-7, 2005
WILDERNESS ADVENTURE AT EAGLE'S LANDING

contributed by Lynn Hassman

This year's MSTP retreat at Eagles Landing was fantastic. There were, of course, the usual exciting activities like mountain biking with the world-renowned cyclist Gary Owens, screaming through the trees on a zip line, or chillin' down the river on an oh-so-comfy tube. And we can't forget the infamous late-night revelry with old and new friends. This year's retreat featured 100% attendance by the incoming class and let me say, they are a fabulous group, hailing from as far away as Paris, France! We had a great time getting to know them before the hustle and bustle of the academic year took off. Another highlight was the renegade Texas couple, Emily and Butch, who made their bed, not inside the conventional comfort of the lodge's sturdy log walls, but outside in a tent!

On Friday night, John Chen delivered an enlightening discussion on the application of power laws to serotonergic neuron development and students presented their latest findings at the poster session. It was the students' treat to spend some casual time with Dr. Dan Theodorescu and Dr. James Mandell along with their families on the zip line and low ropes course. As well as providing helpful highlights of their research to students searching for potential lab rotations, the faculty offered their wisdom and experience for the journey that lies before each of us. This insight was not lost upon the eager ears of the significant others in attendance, who also had the opportunity to hear first hand what their futures might hold.

Hats off to Matt Alexander for his hard work coordinating the retreat, fitting us all into the activities we wanted, and making the weekend great! Whether you packed your days full of outdoor action-adventure, or relaxed on the wrap-around porch with good wine and good friends, it was a weekend well spent.

Retreat coordinator Matt Alexander introduces Drs. Dan Theodorescu, Elizabeth Mandell and James Mandell

John Overdevest takes the rock slide plunge

Emily Sloan and Butch Klotz prepare for the climbing wall

MSTP PHOTO ALBUM

Andrea Davis to
David L. Rivers II
7/10/04

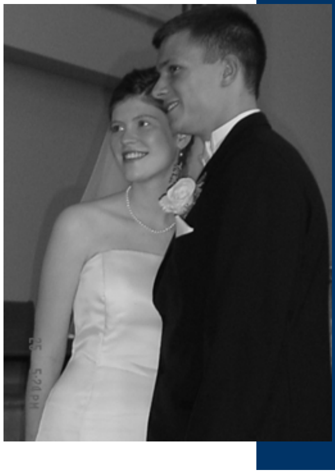
Elaine
Bucheimer
to Shawn
Cagnina
6/18/05

Natalie
Bucheimer to
Christopher
Collins
9/4/04

Carrie Hall to
John Tran
6/25/05

Joe Mettenburg
to Catherine
McConnell
9/11/04

Jeff Sturek
to Jennifer
Clare Fleming
6/25/05



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Comments and contributions are welcome.

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2005 MATCH RESULTS

RUMEY ISHIZAWAR	Brigham & Womens (Internal Medicine)
MEENA KUMAR	Duke University (Internal Medicine)
PAUL LENKOWSKI	University of Iowa (Otolaryngology)
SHANNON SULLIVAN	Georgetown University (Internal Medicine)
PAUL SYKES	Univ. of Alabama - Birmingham (Neurology)
SUNIL THOLPADY	University of Virginia (Plastic Surgery)

UVA SOM REVISES CURRICULUM

(Continued from page 1)

The committee designated to study curriculum felt the clinical skills of our graduates were compromised by various factors including the severity of illness of today's hospital patients, the decreased hours spent training on hospital wards vs. ambulatory care centers, and the decreased number of resident work hours affecting teaching opportunities. To remedy this, more clerkship time has been implemented into the curriculum for standard medical students. The biggest change is that traditional medical students now begin clerkships at the beginning of May of their second year. This is a full two months earlier than the previous start date of July 1. This opens more time in clerkship training for students to acquire clinical skills and to pursue electives that specifically interest them. For the MD/PhD students, this means that 2nd year basic science coursework ends in early March, allowing students to enter PhD laboratory work, continue lab rotations, or complete a clinical clerkship earlier than was possible before. In spite of the additional clerkship time for traditional medical students, MD/PhD students are still only expected to do 14 months of clinical clerkships.

Other changes to the curriculum include the addition of a “Basic Science for Careers” class to be held during the fourth year of medical school. This will be a review of basic medical science tailored to each student's specific area of residency interest. Because of MSTP students' extensive experience in basic science research, this course will not be required of MD/PhD students during their clerkship years. Another recent addition to the curriculum is a United States public health and public policy class to be offered just prior to graduation during the traditional 4th year of medical school. While plans for this course are still tentative, it is unlikely that MD/PhD students will be required to attend this class.

Additional changes to the curriculum affect primarily the 1st and 2nd year students. Among these is the addition of a “Cells to Society” class at the beginning of medical school that explores the entire scope of a specific disease, from molecular pathology to treating the patient to societal implications. Current 1st year medical and MD/PhD students have recently completed this class. Both first and second years start earlier in August than they did previously, and the summer between first and second year has been shortened.

These and other changes are undoubtedly going to improve medical education for both traditional medical students and MD/PhD students. As more changes relating to “The Decade Plan” are implemented to enhance the UVA Health System, it will be important to follow how they will affect the medical school and, more specifically, the MD/PhD program.

HONORS AND AWARDS

SHAWN CARBONELL

First place poster 4th Annual Robert J.Husky Graduate Research Exhibition

NIMA MOSSAMAPARAST

2004 Robert Wagner prize in Microbiology
2004 Michael J. Peach Award

TIM OLSON

2004 Robert M. Berne Outstanding Trainee in Cardiovascular Research
2004 Michael J. Peach Award Finalist

STEVE SMITH

Elected to Associate Member Council of the American Assoc. for Cancer Research

STACEY TROTTER

National Research Service Award Fellowship

JAMES THOMAS

American Heart Assoc. Predoctoral Fellowship award from the Mid-Atlantic Region
First place poster 4th Annual Robert J. Huskey Graduate Research Exhibition

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